

REMARKS

Claims 1-20 are all the claims pending in the application.

I. Specification:

Although not objected to by the Examiner, Applicants implement minor editorial amendments to the specification to make it internally consistent. Namely, Applicants amend the paragraph bridging pages 15 and 16 by deleting reference characters “31a” and “31b” (which are not shown in the figures) in favor of reference characters --33a-- and --33b-- (which are respectively used to designate the intake port and the exhaust port in Fig. 1).

II. Drawings:

The Examiner objects to the drawings because Figs. 12-18 should be designated by a “Prior Art” legend. Applicants amend these figures as suggested by the Examiner.

Although not objected to by the Examiner, Applicants also amended Fig. 12 by changing the lead line extending from reference character “21” to touch the stator iron core (as opposed to the field winding 13).

All of the drawings corrections are shown in red manuscript in the marked up copies of Figs. 12-18 accompanying this response. The Examiner is respectfully requested to acknowledge receipt and indicate approval of the drawing corrections in the next Patent Office paper.

III. Claim Objections:

The Examiner objects to claims 1 and 5-6 because they contain typographical errors.

Applicants amend these claims to address the Examiner's concerns.

IV. Claim Rejections Under 35 U.S.C. § 112(2nd):

The Examiner rejects claims 13, 14, 19, and 20 under 35 U.S.C. § 112(2nd) because they recite terms that are not clear, vague, and/or indefinite. To address the Examiner's concerns, Applicants amend claims 13 and 14 by reciting that --the insulative coating is not broken--. Applicants also amend claim 19 by reciting the step of --directing an insulative resin in an axial direction of the stator iron core--. Finally, Applicants amend claim 20 to recite --wherein the coating of the insulative resin is applied by electrostatic powder coating--.

These amendments are believed to more particularly point out and distinctly claim the subject matter regarded as the invention, thereby overcoming all of the §112(2nd) rejections raised by the Examiner.

V. Claim Rejections on Prior Art Grounds:

The Examiner rejects claims 1, 3, 13, 15, 17, 19, and 20 under 35 U.S.C. § 103(a) as being obvious over JP 1-278242 to Imori et al. ("Imori") in view of U.S. 3,646,374 to Jordan et al. ("Jordan"); claims 2, 4-6, 14, 16, and 18 under 35 U.S.C. § 103(a) as being obvious over Imori in view of Jordan, and further in view of JP 56-3557 to Ogami et al. ("Ogami"); claims 7-8 under 35 U.S.C. § 103(a) as being obvious over Imori in view of Jordan **or** Imori in view of Jordan and Ogami, and further in view of U.S. 2,407,935 to J. F. Perfetti et al. ("Perfetti"); and claims 9-12 under 35 U.S.C. § 103(a) as being obvious over Imori in view of Jordan **or** Imori in

view of Jordan and Ogami, and further in view of JP 2-136074 to Adachi (“Adachi”).

Applicants respectfully traverse all of these rejections in view of the following remarks.

A. Base Claim 1 – The Apparatus:

Base claim 1, which is amended for clarification, recites (among other things):

wherein the number of the slots is at least two for each pole and each phase.

In the present invention, the number of teeth (slots) is two or more for each pole and each phase as shown in Fig. 3, wherein the number of the slots is ninety six and the number of poles is sixteen.

The grounds of rejection rely upon the Imori reference to teach all of the features recited in claim 1, except for a coating on the end surfaces of the stator core. This heavy reliance upon Imori is misplaced.

There are a couple of practical and conceptual differences between the present invention and the Imori reference. The first difference relates to the structure of the conductor wire. In the present invention, a plurality of “conductor segments” are employed. The conductor segments are discrete conductors that are inserted into the stator core, and then connected together to form the stator winding. In sharp contrast, Imori employs a continuous wire strand of conductor. The continuous wire strand is wound on the stator core. The second difference relates to the widths of the teeth. In the present invention, the teeth are thinner than those of the Imori reference. Therefore, the deformation and the shift of the teeth, being one of the objects of the present invention to be solved, does not occur in the Imori reference.

Applicants respectfully assert that the secondary references do not make up the deficiencies of Imori noted above.

B. Base Claim 19 – The Method:

According to claim 19, which is amended for clarification, the method involves (among other things):

directing an insulative resin in an axial direction of the stator iron core.

This specific directing orientation is important because it allows the insulative resin 100 to reach the depths of the slots 24.¹ At least this feature, in combination with the other limitations recited in claim 19, is not taught or suggested by the prior art relied upon in the grounds of rejection.

The grounds of rejection rely upon Jordan to teach an electrostatic method. However, Jordan simply does not indicate the orientation at which the insulative resin is being directed during deposition.

For these reasons, Applicants respectfully assert that claims 1 and 19 are patentable, and that claims 2-18 and 20 are patentable at least by virtue of their dependencies.

In view of the above, reconsideration and allowance of this application are now believed to be in order, and such actions are hereby solicited. If any points remain in issue which the Examiner feels may be best resolved through a personal or telephone interview, the Examiner is kindly requested to contact the undersigned at the telephone number listed below.


¹ Spec., p. 13, first full paragraph.

AMENDMENT UNDER 37 C.F.R. § 1.111
U.S. Appln. No. 09/879,095 (*Q64715*)

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Respectfully submitted,

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APPENDIX
VERSION WITH MARKINGS TO SHOW CHANGES MADE

IN THE SPECIFICATION:

The specification is changed as follows:

Paragraph bridging pages 15 and 16:

Further, a cooling capability is improved because a heat from the coil is effectively transmitted to the stator iron core 21. A flow of the cooling air from the fan 6 is taken in from the intake port ~~31a~~33a, cools a commutator 9 and a regulator 10 as heating elements by passing through in the vicinity of these, passes from an inner diameter side to an outer diameter side between fan blades 6 on both of a front portion and a rear portion, cools a front coil end 22a and a rear coil end 22b of the group of stator windings 22, and is exhausted from the exhaust port ~~31b~~33b. In other words, the coil ends of the group of stator windings 22, of which output performance is affected by a high temperature, are located between the fan blades 6a and the exhaust port ~~31b~~33b of the bracket so as to be certainly cooled. The cooling air from the fan 6 reaches the end surface 27 of the stator iron core 21 to cool the coils, exposed at the coil ends 22a and 23b, and also cool the end surface 27 of the stator iron core 21. When the tissue paper 25 is used, heat conductivity is deteriorated because of a low coefficient of thermal conductivity of the tissue paper and an air intervening in a contact portion between the tissue paper 25 and the inner wall surface of the slot 24. However, because the insulative resin 100 has a coefficient of thermal conductivity higher than that of the tissue paper 25, and the insulative resin 100 is fixed to the inner wall surface of the slot 24 without interposing an air space, a heat from the coil is

effectively transmitted to the stator iron core 21, and a heat can be dissipated from the end surface 27 of the stator iron core 21, receiving a cooling air.

IN THE CLAIMS:

The claims are amended as follows:

1. (Amended) An a.c. generator for a vehicle comprising:

a rotator;

a stator iron core, arranged opposite to an outer periphery of the rotator and having a plurality of slots; and

~~a stator including~~ a plurality of conductor segments, ~~which are~~ accommodated in the slots to form a stator winding,

wherein the stator iron core is insulated from the conductor segments by coating at least ~~an end surface~~surfaces of the stator iron core and ~~an inner wall surfaces~~ of the slots with an insulative resin, and

wherein the number of the slots is at least two for each pole and each phase.
3. (Amended) The a.c. generator for the vehicle according to Claim 1,

wherein the stator iron core ~~is formed to be in~~has a rounded shape or a chamfered shape around opening edges of the slots on the sides of the end surfaces of the stator iron core.
4. (Amended) The a.c. generator for the vehicle according to Claim 2,

wherein the stator iron core ~~is formed to be in~~has a rounded shape or a chamfered shape around opening edges of the slots on the sides of the end surfaces of the stator iron core.

5. (Amended) The a.c. generator for the vehicle according to Claim 1,
wherein the insulative resin is ~~made thicker at around~~ opening edges of the slots on sides of the end surfaces of the stator iron core than at center portions of the slots in ~~their~~an axial ~~directions~~direction.

6. (Amended) The a.c. generator for the vehicle according to Claim 2,
wherein the insulative resin is ~~made thicker at around~~ opening edges of the slots on sides of the end surfaces of the stator iron core than at center portions of the slots in ~~their~~an axial ~~directions~~direction.

13. (Amended) The a.c. generator for the vehicle according to Claim 1,
wherein the insulative resin ~~has a breaking strength sufficient to withstand breakage,~~
~~caused~~is not broken at a time of inserting the conductor segments into the slots.

14. (Amended) The a.c. generator for the vehicle according to Claim 2,
wherein the insulative resin ~~has a breaking strength sufficient to withstand breakage,~~
~~caused~~is not broken at a time of inserting the conductor segments into the slots.

AMENDMENT UNDER 37 C.F.R. § 1.111
U.S. Appln. No. 09/879,095 (Q64715)

19. (Amended) A method of producing an a.c. generator for a vehicle comprising steps of:

forming a stator iron core by laminating annular steel sheets, in which ~~a shape of slots~~
~~is~~are punched out; and

directing an insulative resin in an axial direction of the stator iron core to coatingcoat at
least inner wall surfaces of the slots and end surfaces of the stator iron core ~~from axial direction~~
~~of the stator iron core with an~~the insulative resin.

20. (Amended) The method of producing the a.c. generator for the vehicle
according to Claim 19,

wherein the coating of the insulative resin is ~~provided~~applied by electrostatic powder
coating.